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EXAMINER	
KIM, DAVID S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/780,683	SHARRATT ET AL.	
	Examiner	Art Unit	
	David S. Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *43-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *43-68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Aksyuk et al.

2. **Claims 43-44, 48, 54-57, 61, and 67-68** are rejected under 35 U.S.C. 102(a) as being anticipated by Aksyuk et al. (European Patent Application EP 0 926 853 A2).

Regarding claim 43, Aksyuk et al. discloses:

An optical communication system, comprising:

a) a first optical path (path from waveguide 202 to WGR 240 in Fig. 4) for guiding information-bearing, first optical radiation partitioned into a plurality of wavebands;

b) a second optical path (path after WGR 240 through waveguide 212 in Fig. 4) for guiding information-bearing, second optical radiation partitioned into the same plurality of wavebands; and

c) interfacing means (WSADM 1a in Fig. 4) for selectively communicating at least one component (spectral component 270_2 in Fig. 4) of the first radiation corresponding to at least one selected waveband from the first path to the second path, the interfacing means including

i) waveband selective diverting means (WGR 240) in the first path, for selecting and diverting said at least one component of the first radiation corresponding to said at least one selected waveband from the first path to an entry point (entrance into waveguide 206_2) in the second path for guidance away from the entry point along the second path, and

ii) waveband selective attenuating means (switch $S1_2$) upstream of the entry point in the second path, for selecting and blocking said at least one component corresponding to said at least one selected waveband from the second radiation (radiation on right side of switch $S1_2$).

Regarding claim 44, Aksyuk et al. discloses:

The system of claim 43, wherein the interfacing means includes waveband selective coupling means (WGR 240) for selecting and coupling at least one component from the first radiation diverted by the diverting means to the entry point.

Regarding claim 48, Aksyuk et al. discloses:

The system of claim 44, wherein the diverting means (WGR 240), the attenuating means (switch $S1_2$) and the coupling means (WGR 240) operate on the optical radiation in the optical domain (note that each means processes optical signals all in the optical domain).

Regarding claim 54, Aksyuk et al. discloses:

The system of claim 43, wherein each path includes a plurality of subpaths (in the first path, each spectral component travels along its own subpath in the frequency domain; in the second path, each spectral component has its own waveguide 206).

Regarding claim 55, Aksyuk et al. discloses:

The system of claim 43, wherein each path is operative for bidirectionally (in the first path, note the bi-directional propagation along the waveguide between circulator 220 and WGR 240; in the second path, note the bi-directional propagation in switch $S1_2$) guiding the respective

radiation therealong, and wherein the interfacing means (WSADM 1a) is operative for communicating said at least one component guided in one direction of the first path (to the right in Fig. 4) for guidance along an opposite direction of the second path (switch $S1_2$ directs the component to the left in Fig. 4).

Regarding claims 56-57, 61, and 67-68, claims 56, 57, 61, 67, and 68 are apparatus claims that correspond to system claims 43, 44, 48, 54, and 55, respectively. Therefore, the recited means in system claims 43-44, 48, and 54-55 read on the corresponding means in apparatus claims 56-57, 61, and 67-68.

Egnell et al.

3. **Claims 43-44, 48, 54, 56-57, 61, and 67** are rejected under 35 U.S.C. 102(e) as being anticipated by Egnell et al. (U.S. Patent No. 6,590,681 B1).

Regarding claim 43, Egnell et al. discloses:

An optical communication system, comprising:

a) a first optical path (7le to 7re in Fig. 5) for guiding information-bearing, first optical radiation partitioned into a plurality of wavebands;

b) a second optical path (7rw to 7lw in Fig. 5) for guiding information-bearing; second optical radiation partitioned into the same plurality of wavebands; and

c) interfacing means (node 1) for selectively communicating at least one component (λre2) of the first radiation corresponding to at least one selected waveband from the first path to the second path, the interfacing means including

i) waveband selective diverting means (17e and 37e) in the first path, for selecting and diverting said at least one component of the first radiation corresponding to said at least one selected waveband from the first path to an entry point (23w) in the second path for guidance away from the entry point along the second path, and

ii) waveband selective attenuating means (31w) upstream of the entry point in the second path, for selecting (filter 31w selects which wavelengths to filter) and blocking (λre2 component from first path is blocked from radiation filtered by 31w) said at least one component corresponding to said at least one selected waveband from the second radiation.

Regarding claim 44, Egnell et al. discloses:

The system of claim 43, wherein the interfacing means includes waveband selective coupling means (37e) for selecting and coupling at least one component from the first radiation diverted by the diverting means to the entry point.

Regarding claim 48, Egnell et al. discloses:

The system of claim 44, wherein the diverting means (17e and 37e), the attenuating means (31w) and the coupling means (37e) operate on the optical radiation in the optical domain (note that each means processes optical signals all in the optical domain).

Regarding claim 54, Egnell et al. discloses:

The system of claim 43, wherein each path includes a plurality of subpaths (in each path, each spectral component travels along its own subpath in the frequency domain).

Regarding claims 56-57, 61, and 67, claims 56, 57, 61, and 67 are apparatus claims that correspond to system claims 43, 44, 48, and 54, respectively. Therefore, the recited means in system claims 43-44, 48, and 54 read on the corresponding means in apparatus claims 56-57, 61, and 67.

Arecco et al.

4. **Claims 43-44, 48, 54, 56-57, 61, and 67** are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Arecco et al. (U.S. Patent No. 5,903,371).

Regarding claim 43, Arecco et al. discloses:

An optical communication system, comprising:

a) a first optical path (first ring network in col. 11, l. 64 – col. 12, l. 29) for guiding information-bearing, first optical radiation partitioned into a plurality of wavebands (reserved wavelengths, col. 12, l. 4-5);

b) a second optical path (second ring network in col. 11, l. 64 – col. 12, l. 29) for guiding information-bearing, second optical radiation partitioned into the same plurality of wavebands (reserved wavelengths, col. 12, l. 4-5); and

c) interfacing means (OADM units, col. 12, l. 10-12) for selectively communicating at least one component (col. 12, l. 6-9) of the first radiation corresponding to at least one selected waveband (reserve wavelength(s) "dropped" from the first network and "added" into the second network, col. 12, l. 6-7) from the first path to the second path, the interfacing means including

i) waveband selective diverting means (OADMs along the rings of the first network, col. 12, l. 10-19) in the first path, for selecting and diverting said at least one component of the first radiation corresponding to said at least one selected waveband from the first path to an entry point (exit from OADMs of the second network to enter the rings of the second network, col. 12, l. 10-19) in the second path for guidance away from the entry point along the second path, and

ii) waveband selective attenuating means (note wavelength selective couplers employed in the OADMs, Figs. 2-3, attenuation in Fig. 4, col. 9, l. 38-54) upstream of the entry point in the second path, for selecting (in OADMs, couplers in Fig. 2 that are operable to select wavelength(s) "dropped" from the first network and "added" to the second network, such wavelength(s) are reserve wavelength(s) of col. 12, l. 6-7) and blocking said at least one component corresponding to said at least one selected waveband from the second radiation (in OADMs, couplers in Fig. 2 that are operable to block by "dropping" wavelength(s) from the second network, such wavelength(s) are

reserve wavelength(s) of col. 12, l. 8-10, these "dropped" signals do not interact with "added" signals).

Regarding claim 44, Arecco et al. discloses:

The system of claim 43, wherein the interfacing means includes waveband selective coupling means (couplers in Fig. 2 that direct reserve wavelength(s) from the first ring network to the second ring network, col. 12, l. 6-8) for selecting and coupling at least one component from the first radiation diverted by the diverting means to the entry point.

Regarding claim 48, Arecco et al. discloses:

The system of claim 44, wherein the diverting means (OADMs), the attenuating means (couplers in OADMs) and the coupling means (couplers in Fig. 2 that direct reserve wavelength(s) from the first ring network to the second ring network, col. 12, l. 6-8) operate on the optical radiation in the optical domain (note that each means processes optical signals all in the optical domain).

Regarding claim 54, Arecco et al. discloses:

The system of claim 43, wherein each path includes a plurality of subpaths (each ring network comprises a main ring and a secondary ring).

Regarding claims 56-57, 61, and 67, claims 56, 57, 61, and 67 are apparatus claims that correspond to system claims 43, 44, 48, and 54, respectively. Therefore, the recited means in system claims 43-44, 48, and 54 read on the corresponding means in apparatus claims 56-57, 61, and 67.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Egnell et al. as primary reference

7. **Claims 45-47 and 58-60** are rejected under 35 U.S.C. 103(a) as being unpatentable over Egnell et al. as applied to claims 43-44 and 56-57 above, and further in view of Liu (U.S. Patent No. 6,519,060 B1).

Regarding claim 45, Egnell et al. discloses:

The system of claim 43, wherein the diverting means includes waveband selective filtering means (37e) for spatially separating components of the first radiation.

Egnell et al. does not expressly disclose:

wherein the diverting means also includes liquid crystal attenuating means associated with each component of the first radiation for selectively transmitting or diverting said at least one component of the first radiation corresponding to said at least one selected waveband.

However, liquid crystal attenuating means associated with a component of radiation for selectively transmitting or diverting the component of the radiation are known in the art. Liu teaches similar diverting and filtering means (Liu, Fig. 4) that includes such liquid crystal

attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the diverting, filtering, and liquid crystal attenuating means of Liu in the diverting means of Egnell et al. One of ordinary skill in the art would have been motivated to do this since these means of Liu provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claim 46, Egnell et al. discloses:

The system of claim 44, wherein the coupling means includes waveband selective filtering means (37e) for spatially separating components of the first radiation.

Egnell et al. does not expressly disclose:

wherein the coupling means also includes liquid crystal attenuating means associated with each component of the first radiation for selectively transmitting or diverting said at least one component of the first radiation corresponding to said at least one selected waveband to the entry point.

However, liquid crystal attenuating means associated with a component of radiation for selectively transmitting or diverting the component of the radiation are known in the art. Liu teaches similar coupling and filtering means (Liu, Fig. 4) that includes such liquid crystal attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the coupling, filtering, and liquid crystal attenuating means of Liu in the coupling means of Egnell et al. One of ordinary skill in the art would have been motivated to do this since these means of Liu provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claim 47, Egnell et al. discloses:

The system of claim 44, wherein the attenuating means includes waveband selective filtering means (31w).

Egnell et al. does not expressly disclose:

wherein the waveband selective filtering means are *for spatially separating components of the second radiation*; and

wherein the attenuating means includes liquid crystal attenuating means associated with each component of the second radiation for selectively transmitting or diverting the components of the second radiation relative to the second path.

However, these two limitations are known in the art. Liu teaches similar attenuating and filtering means (Liu, Fig. 4) that includes such liquid crystal attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the coupling, filtering, and liquid crystal attenuating means of Liu in the coupling means of Egnell et al. One of ordinary skill in the art would have been motivated to do this since these means of Liu provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claims 58-60, claims 58, 59, and 60 are apparatus claims that correspond to system claims 45, 46, and 47, respectively. Therefore, the recited means in system claims 45-47 read on the corresponding means in apparatus claims 58-60.

8. **Claims 49-51 and 62-64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Egnell et al. as applied to claims 44 and 57 above, and further in view of Bononi et al. ("Analysis of hot-potato optical networks with wavelength conversion").

Regarding claim 49, Egnell et al. discloses:

The system of claim 44, wherein the coupling means includes waveband switching means (note the general switch of a waveband on 7le to 7lw in Fig. 5) for transferring information conveyed on a first set of components (spectral components on 7le in Fig. 5) of the

radiation diverted by the diverting means to a second set of components (spectral components on 71w) for guidance along the second path.

Egnell et al. does not expressly disclose:

the first set and the second set having different wavebands.

However, waveband switching means that convert a first set of components/wavebands of into a second set of differing components/wavebands are extremely well known in the art. A common term for such means is "wavelength converters." Bononi et al. teaches the conversion of the wavelength of a signal into a different wavelength (Bononi et al., whole document). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement wavelength converters as part of the waveband switching means of Egnell et al. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Egnell et al.

Regarding claim 50, Egnell et al. in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (37e) for isolating a component of a selected waveband in the first radiation diverted from the first path, detecting means (Bononi et al., PD in Fig. 3) for converting the isolated component into an electrical signal, and an optical radiation source (Bononi et al., OTX in Fig. 3) modulated by the signal for generating radiation bearing the signal at a waveband different (Bononi et al., p. 527, section B) from the selected waveband for guidance along the second path.

Regarding claim 51, Egnell et al. in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (37e) for isolating a component of a selected waveband in the first radiation diverted from the first path, and an optical radiation source (Bononi et al., OTX in Fig. 3).

Egnell et al. in view of Bononi et al. does not expressly disclose:

said optical radiation source being biased substantially at its lasing threshold and stimulated by the isolated component, for generating a stimulated component modulated by information carried by the isolated component at a waveband different from the selected waveband for guidance along the second path.

However, Examiner takes Official Notice that this limitation is another common technique for providing wavelength conversion. Similar to the other means of Bononi et al., this limitation provides the same general benefit of the wavelength conversion means of Bononi et al. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this limitation as part of the waveband selecting means of Egnell et al. in view of Bononi et al. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Egnell et al.

Regarding claims 62-64, claims 62, 63, and 64 are apparatus claims that correspond to system claims 49, 50, and 51, respectively. Therefore, the recited means in system claims 49-51 read on the corresponding means in apparatus claims 62-64.

9. **Claims 52-53, 55, 65-66, and 68** are rejected under 35 U.S.C. 103(a) as being unpatentable over Egnell et al. as applied to claims 43-44 and 56-57 above, and further in view of Ramaswami et al. (*Optical Networks: A Practical Perspective*).

Regarding claim 52, Egnell et al. does not expressly disclose:

The system of claim 44, wherein the coupling means includes regenerating means for regenerating the radiation guided therethrough.

However, nodes that comprise coupling means that include regenerating means for regenerating radiation guided therethrough are well known and common in the art. In particular, Egnell et al. describes means in the node that matches all of the technical means for regenerating means (receiver 11e and transmitter 13e in Fig. 5 in view of col. 4, l. 44-49). That is, Egnell et al. teaches converting a signal from optical form to electrical form and back to optical form. This very teaching matches the description of standard regeneration means, described by Ramaswami et al. (Ramaswami et al., p. 10-11). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to expressly incorporate regeneration means in the node of Egnell et al. One of ordinary skill in the art would have been motivated to do this since there are transmission situations where an optical signal "may not be able to remain in optical form all the way to its destination and may have to be regenerated in between" (Ramaswami et al., p. 10, last paragraph).

Regarding claim 53, Egnell et al. does not expressly disclose:

The system of claim 43, wherein each path is operative for bidirectionally guiding the respective radiation therealong, and wherein the interfacing means is operative for communicating said at least one component guided in either direction of the first path for guidance along either direction of the second path.

However, bi-directional paths are extremely well known and common in the art. Ramaswami et al. teaches bi-directional systems and discusses various considerations related to bi-directional systems (Ramaswami et al., p. 505-507). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange the paths of Egnell et al. to incorporate bi-directional teachings so that the interfacing means is operative for communicating said at least one component guided in either direction of the first path for guidance along either direction of the second path. One of ordinary skill in the art would have

been motivated to do this for a variety of reasons, such as gradual capacity increasing (Ramaswami et al., p. 505, item 1), no need for automatic protection switching protocol (Ramaswami et al., p. 505, item 4), better support for some ring systems (Ramaswami et al., p. 506, item 5), better support for some point-to-point systems (Ramaswami et al., p. 506, item 6), the ability to handle asymmetric traffic (Ramaswami et al., p. 506, item 7), and higher amplifier output powers per channel and more gain flatness (Ramaswami et al., p. 507, item 8).

Regarding claim 55, Egnell et al. discloses:

The system of claim 43, wherein the interfacing means is operative for communicating said at least one component guided in one direction (to the right in 7le in Fig. 5) of the first path for guidance along an opposite direction (to the left in 7lw in Fig. 5) of the second path.

Egnell et al. does not expressly disclose:

wherein each path is operative for bidirectionally guiding the respective radiation therealong.

However, bi-directional paths are extremely well known and common in the art. Ramaswami et al. teaches bi-directional systems and discusses various considerations related to bi-directional systems (Ramaswami et al., p. 505-507). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange the paths of Egnell et al. to incorporate bi-directional teachings. One of ordinary skill in the art would have been motivated to do this for a variety of reasons, such as gradual capacity increasing (Ramaswami et al., p. 505, item 1), no need for automatic protection switching protocol (Ramaswami et al., p. 505, item 4), better support for some ring systems (Ramaswami et al., p. 506, item 5), better support for some point-to-point systems (Ramaswami et al., p. 506, item 6), the ability to handle asymmetric traffic (Ramaswami et al., p. 506, item 7), and higher amplifier output powers per channel and more gain flatness (Ramaswami et al., p. 507, item 8).

Regarding claims 65-66 and 68, claims 65, 66, and 68 are apparatus claims that correspond to system claims 52, 53, and 55, respectively. Therefore, the recited means in system claims 52-53 and 55 read on the corresponding means in apparatus claims 65-66 and 68.

Arecco et al. as primary reference

10. **Claims 45-47 and 58-60** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arecco et al. as applied to claims 43-44 and 56-57 above, and further in view of Liu (U.S. Patent No. 6,519,060 B1).

Regarding claim 45, Arecco et al. discloses:

The system of claim 43, wherein the diverting means includes waveband selective filtering means (couplers in Fig. 2 that drop reserve wavelength(s) from the first ring network of col. 12, l. 6-8, note the spatial separation in Fig. 3) for spatially separating components of the first radiation.

Arecco et al. does not expressly disclose:

wherein the diverting means also includes liquid crystal attenuating means associated with each component of the first radiation for selectively transmitting or diverting said at least one component of the first radiation corresponding to said at least one selected waveband.

However, liquid crystal attenuating means associated with a component of radiation for selectively transmitting or diverting the component of the radiation are known in the art. Liu teaches similar diverting and filtering means (Liu, Fig. 4) that includes such liquid crystal attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the diverting, filtering, and liquid crystal attenuating means of Liu in the diverting means of Arecco et al. One of ordinary skill in the art would have been motivated to do this

since Arecco et al. suggests the use of alternative diverting and filtering means of functional equivalence (col. 10, l. 38-43), and these means of Liu constitute such means of functional equivalence that also provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claim 46, Arecco et al. discloses:

The system of claim 44, wherein the coupling means includes waveband selective filtering means (couplers in Fig. 2 that direct reserve wavelength(s) from the first ring network to the second ring network, col. 12, l. 6-8, note spatial separation in Fig. 3) for spatially separating components of the first radiation.

Arecco et al. does not expressly disclose:

wherein the coupling means also includes liquid crystal attenuating means associated with each component of the first radiation for selectively transmitting or diverting said at least one component of the first radiation corresponding to said at least one selected waveband to the entry point.

However, liquid crystal attenuating means associated with a component of radiation for selectively transmitting or diverting the component of the radiation are known in the art. Liu teaches similar coupling and filtering means (Liu, Fig. 4) that includes such liquid crystal attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the coupling, filtering, and liquid crystal attenuating means of Liu in the coupling means of Arecco et al. One of ordinary skill in the art would have been motivated to do this since Arecco et al. suggests the use of alternative diverting and filtering means of functional equivalence (col. 10, l. 38-43), and these means of Liu constitute such means of functional equivalence that also provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claim 47, Arecco et al. discloses:

The system of claim 44, wherein the attenuating means includes waveband selective filtering means (couplers in Fig. 2) for spatially separating components of the second radiation (in OADMs of second ring network).

Arecco et al. does not expressly disclose:

wherein the attenuating means includes liquid crystal attenuating means associated with each component of the second radiation for selectively transmitting or diverting the components of the second radiation relative to the second path.

However, this limitation is known in the art. Liu teaches similar attenuating and filtering means (Liu, Fig. 4) that includes such liquid crystal attenuating means (Liu, switch 590 in Fig. 5, col. 8, l. 34 – col. 9, l. 56). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the coupling, filtering, and liquid crystal attenuating means of Liu in the coupling means of Arecco et al. One of ordinary skill in the art would have been motivated to do this since Arecco et al. suggests the use of alternative diverting and filtering means of functional equivalence (col. 10, l. 38-43), and these means of Liu constitute such means of functional equivalence that also provide good isolation between adjacent channels (Liu, col. 5, l. 7-22).

Regarding claims 58-60, claims 58, 59, and 60 are apparatus claims that correspond to system claims 45, 46, and 47, respectively. Therefore, the recited means in system claims 45-47 read on the corresponding means in apparatus claims 58-60.

11. **Claims 49-51 and 62-64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arecco et al. as applied to claims 44 and 57 above, and further in view of Bononi et al. ("Analysis of hot-potato optical networks with wavelength conversion").

Regarding claim 49, Arecco et al. discloses:

The system of claim 44, wherein the coupling means includes waveband switching means (note the general switch of a reserve wavelength on the first ring network to the second ring network in col. 12, l. 4-10) for transferring information conveyed on a first set of components (reserve wavelength(s) on first ring network) of the radiation diverted by the diverting means to a second set of components (reserve wavelength(s) on second ring network) for guidance along the second path.

Arecco et al. does not expressly disclose:

the first set and the second set having different wavebands.

However, waveband switching means that convert a first set of components/wavebands of into a second set of differing components/wavebands are extremely well known in the art. A common term for such means is "wavelength converters." Bononi et al. teaches the conversion of the wavelength of a signal into a different wavelength (Bononi et al., whole document). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement wavelength converters as part of the waveband switching means of Arecco et al. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Arecco et al.

Regarding claim 50, Arecco et al. in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (couplers in Fig. 2 that drop reserve wavelength(s) from the first ring network of col. 12, l. 6-8) for isolating a component of a selected waveband in the first radiation diverted from the first path, detecting means (Bononi et al., PD in Fig. 3) for converting the isolated component into an electrical signal, and an optical radiation source (Bononi et al., OTX in Fig. 3) modulated

by the signal for generating radiation bearing the signal at a waveband different (Bononi et al., p. 527, section B) from the selected waveband for guidance along the second path.

Regarding claim 51, Arecco et al. in view of Bononi et al. discloses:

The system of claim 49, wherein the switching means includes waveband selecting means (couplers in Fig. 2 that drop reserve wavelength(s) from the first ring network of col. 12, l. 6-8) for isolating a component of a selected waveband in the first radiation diverted from the first path, and an optical radiation source (Bononi et al., OTX in Fig. 3).

Arecco et al. in view of Bononi et al. does not expressly disclose:

said optical radiation source being biased substantially at its lasing threshold and stimulated by the isolated component, for generating a stimulated component modulated by information carried by the isolated component at a waveband different from the selected waveband for guidance along the second path.

However, Examiner takes Official Notice that this limitation is another common technique for providing wavelength conversion. Similar to the other means of Bononi et al., this limitation provides the same general benefit of the wavelength conversion means of Bononi et al. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this limitation as part of the waveband selecting means of Arecco et al. in view of Bononi et al. One of ordinary skill in the art would have been motivated to do this for the conventional benefit of wavelength converters: to prevent wavelength blocking and contention (Bononi et al., p. 525, col. 2) in the second path of Arecco et al.

Regarding claims 62-64, claims 62, 63, and 64 are apparatus claims that correspond to system claims 49, 50, and 51, respectively. Therefore, the recited means in system claims 49-51 read on the corresponding means in apparatus claims 62-64.

12. **Claims 52 and 65** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arecco et al. as applied to claims 44 and 57 above, and further in view of Ramaswami et al. (*Optical Networks: A Practical Perspective*).

Regarding claim 52, Arecco et al. does not expressly disclose:

The system of claim 44, wherein the coupling means includes regenerating means for regenerating the radiation guided therethrough.

However, nodes that comprise coupling means that include regenerating means for regenerating radiation guided therethrough are well known and common in the art. In particular, Arecco et al. describes means in the node that corresponds closely to all of the technical means for regenerating means (receiver and transmitter in line terminal 39 in Fig. 2 in view of col. 6, l. 48-56). That is, Arecco et al. teaches an optical receiver for users connected thereto. Optical receivers conventionally convert optical signals to electrical form. Arecco et al. also teaches an optical transmitter for the same users connected thereto. Optical transmitters conventionally convert electrical signals into optical form. These conventional teachings match the description of standard regeneration means, described by Ramaswami et al. (Ramaswami et al., p. 10-11). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to expressly incorporate regeneration means in the node of Arecco et al. One of ordinary skill in the art would have been motivated to do this since there are transmission situations where an optical signal "may not be able to remain in optical form all the way to its destination and may have to be regenerated in between" (Ramaswami et al., p. 10, last paragraph).

Regarding claim 65, claim 65 is an apparatus claim that corresponds to system claim 52. Therefore, the recited means in system claim 52 read on the corresponding means in apparatus claim 65.

13. **Claims 53, 55, 66, and 68** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arecco et al. as applied to claims 43 and 56 above, and further in view of Asahi (U.S. Patent No. 6,023,359).

Regarding claim 53, Arecco et al. discloses:

The system of claim 43, wherein each path is operative for bidirectionally guiding the respective radiation therealong (note that each ring network is bi-directional as shown in Fig. 2).

Arecco et al. does not expressly disclose:

wherein the interfacing means is operative for communicating said at least one component guided in either direction of the first path for guidance along either direction of the second path.

However, such interfacing means are known in the art. Asahi teaches a system, also with two bi-directional ring networks, wherein an interfacing means is operative for communicating at least one component guided in either direction of a first path for guidance along either direction of a second path (Asahi, Fig. 14). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this operation in the interfacing means of Arecco et al. One of ordinary skill in the art would have been motivated to do this to incorporate the fault recovery benefits disclosed by Asahi (Asahi, Fig. 14).

Regarding claim 55, Arecco et al. discloses:

The system of claim 43, wherein each path is operative for bidirectionally guiding the respective radiation therealong (note that each ring network is bi-directional as shown in Fig. 2).

Arecco et al. does not expressly disclose:

wherein the interfacing means is operative for communicating said at least one component guided in one direction of the first path for guidance along an opposite direction of the second path.

However, such interfacing means are known in the art. Asahi teaches a system, also with two bi-directional ring networks, wherein an interfacing means is operative for communicating at least one component guided in one direction of a first path for guidance along an opposite direction of a second path (Asahi, Fig. 14). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this operation in the interfacing means of Arecco et al. One of ordinary skill in the art would have been motivated to do this to incorporate the fault recovery benefits disclosed by Asahi (Asahi, Fig. 14).

Regarding claims 66 and 68, claims 66 and 68 are apparatus claims that correspond to system claims 53 and 55, respectively. Therefore, the recited means in system claims 53 and 55 read on the corresponding means in apparatus claims 66 and 68.

Response to Arguments

14. Applicant's arguments filed 29 April 2004 (Paper No. 10) have been fully considered but they are not persuasive.

Regarding Egnell et al., Applicant states,

> "Egnell discloses a first optical fiber 7le, 7re and a second optical fiber 7lw, 7rw, but there is no diversion of a selected waveband from a first radiation between these fibers, not any attenuating means for blocking the selected waveband from a second radiation" (Paper No. 10, p. 11, last full paragraph).

Examiner respectfully disagrees. Notice the diverting means (17e and 37e) of Egnell. Also, notice the attenuating means (31w) of Egnell. In view of these references, Examiner finds it difficult to consider Applicant's argument to be persuasive.

Regarding Arecco et al., Applicant states,

> "Arecco discloses a first path 8, 31, 45, 46, 41, 43, 5 and a second path 9, 32, 47, 48, 42, 44, 12. However, there is no diversion of a selected waveband from a first radiation

between these paths, not any attenuating means for blocking the selected waveband from a second radiation (Paper No. 10, p. 11-12, bridging paragraph).

Examiner respectfully disagrees. Notice the diverting means (OADMs along the rings of the first network, col. 12, l. 10-19) of Arecco. Also, notice the attenuating means (note wavelength selective couplers employed in the OADMs, Figs. 2-3, attenuation in Fig. 4, col. 9, l. 38-54) of Arecco. In view of these references, Examiner finds it difficult to consider Applicant's argument to be persuasive.

Also, in response to Applicant's argument that the references fail to show **certain features** of applicant's invention, it is noted that the features upon which applicant relies (i.e., *reflecting radiation, blocking a wavelength from a second radiation which would otherwise interfere with the same wavelength from a first radiation that was diverted to a second path*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Summarily, Applicant's arguments are not persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

15. Applicant's arguments with respect to the newly submitted claims 43-68 have been considered but are also moot in view of the new ground(s) of rejection under **Aksyuk et al.** The submission of new claims 43-68 and the corresponding new scope of the claimed subject matter necessitated an update search and reconsideration of the prior art of record.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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